

Notice of Allowability

Application No.

10/676,155

Examiner

John H. Le

Applicant(s)

UFFENKAMP ET AL.

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2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's amendment filed 02/07/2005.
2. ☒ The allowed claim(s) is/are 1-28.
3. ☒ The drawings filed on 01 October 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Response to Amendment

1. Applicant's amendment filed 02/07/2005 has been entered and carefully considered.

Claims 1, 3, 10, 12, 15, 23, 24, and 28 has been amended.

Reasons for Allowance

2. Claims 1-28 are allowed.
3. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 1, in combination with other limitations of claims, the cited prior arts fail to teach a method for calibrating at least one image sensor system, which is located at a motor vehicle, by the use of at least one calibrating object, wherein the method comprising: generating, using the at least one image sensor system, image data of the at least one calibrating object; determining, from generated image data of the at least one calibrating object, an alignment of the at least one image sensor system with respect to a geometric travel axis of the motor vehicle, wherein the geometric travel axis being a bisector of total toe-in angle of a rear the motor vehicle. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 3, in combination with other limitations of claims, the cited prior arts fail to teach a method for calibrating at least one image sensor system, which is located at a motor vehicle, by the use of at least one calibrating object, wherein the

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method comprising: determining, from generated image data of the at least one calibrating object, an alignment of the at least one image sensor system with respect to a geometric travel axis of the motor vehicle; and determining a calibration using a determined alignment of the at least one image sensor system with respect to the geometric travel axis of the motor vehicle, wherein in the determining of the alignment, at least one pointer is aligned at at least one non-steered wheel of the motor vehicle by the at least one pointer, at least one marking point is generated on the at least one calibrating object, and data on the geometric travel axis of the motor vehicle is derivable from the at least one marking point. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claims 10 and 15, in combination with other limitations of claims, the cited prior arts fail to teach a device for calibrating at least one image sensor system which is located at a motor vehicle, by the use of at least one calibrating object, wherein the device comprising: at least one evaluation arrangement to evaluate image data of the at least one image sensor system, which generates the image data of the at least one calibrating object, and which includes a determining arrangement to determine, from generated image data of the at least one calibrating object, an alignment of the at least one image sensor system with respect to a geometric travel axis of the motor vehicle, wherein the geometric travel axis being a bisector of total toe-in angle of a rear the motor vehicle. It is these limitations as they are claimed in the combination with

other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 12, in combination with other limitations of claims, the cited prior arts fail to teach a device for calibrating at least one image sensor system which is located at a motor vehicle, by the use of at least one calibrating object, wherein the device comprising: at least one evaluation arrangement to evaluate image data of the at least one image sensor system, which generates the image data of the at least one calibrating object, and which includes a determining arrangement to determine, from generated image data of the at least one calibrating object, an alignment of the at least one image sensor system with respect to a geometric travel axis of the motor vehicle; wherein a calibration is determined using a determined alignment of the at least one image sensor system with respect to the geometric travel axis of the motor vehicle; and wherein at least one pointer is aligned on at least one non-steered wheel of the motor vehicle, and at least one pointer beam of the at least one pointer generates at least one marking point on the at least one calibrating object. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 23, in combination with other limitations of claims, the cited prior arts fail to teach a method for calibrating at least one image sensor system which is located at a motor vehicle, by the use of at least one calibrating object, the method comprising: determining a calibration using a determined alignment of the at least one

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image sensor system with respect to the geometric travel axis of the motor vehicle; wherein there are at least two image sensor systems which image essentially the same scene, and the alignment of each of the image sensor systems with respect to the geometric travel axis of the motor vehicle is determined separately for each of the image sensor systems, from which the alignment of the image sensor systems to each other is determined; wherein the at least two image sensor systems include at least a stereo camera system; and wherein the intrinsic calibration data includes at least one of the camera's principal point, the camera's principal distance, at least one distortion parameter, and an influence of a glass pane in a light path of the camera. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 24, in combination with other limitations of claims, the cited prior arts fail to teach a method for calibrating at least one image sensor system which is located at a motor vehicle, by the use of at least one calibrating object, the method comprising: determining a calibration using a determined alignment of the at least one image sensor system with respect to the geometric travel axis of the motor vehicle; wherein there are at least two image sensor systems which image essentially the same scene, and the alignment of each of the image sensor systems with respect to the geometric travel axis of the motor vehicle is determined separately for each of the image sensor systems, from which the alignment of the image sensor systems to each other is determined; wherein the at least two image sensor systems include at least a

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stereo camera system; and wherein the intrinsic calibration data includes at least one of a principal point, a principal distance, at least one distortion parameter, and an influence of a glass pane in a light path of at least one of the at least two image sensor systems. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John H. Le whose telephone number is 571-272-2275.

The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John H. Le

Patent Examiner-Group 2863

February 26, 2005



MICHAEL NGHIEM
PRIMARY EXAMINER